

EPIDEMIOLOGY OF
Childhood Malnutrition in India
and Control Strategies

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Malnutrition

Lack of proper nutrition, caused by **not having enough** to eat, **not eating enough of the right things**, or being **unable to use the food** that one does eat

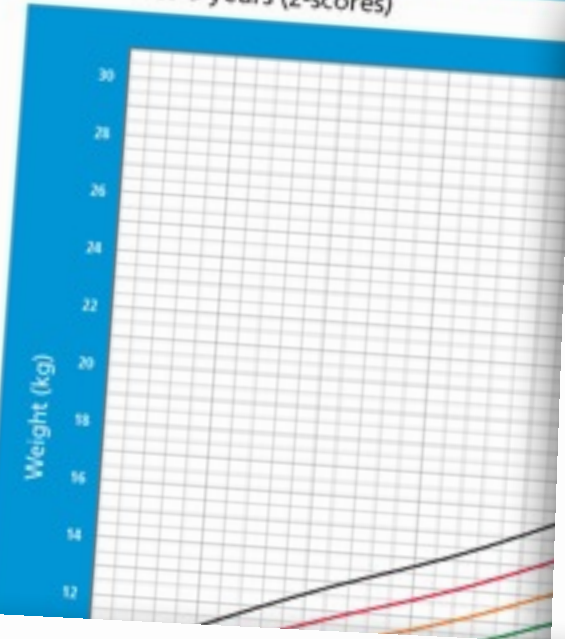
Height-for-age (stunting)

Weight-for-height (wasting)

Weight-for-age (underweight)

Growth Standards

Weight-for-height BOYS
2 to 5 years (z-scores)



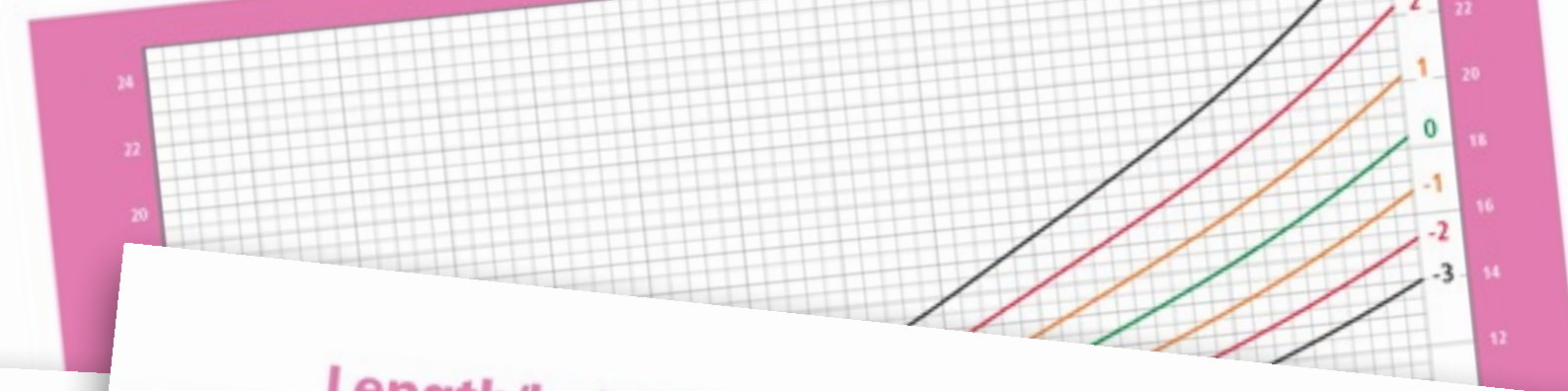
Weight-for-Height GIRLS
2 to 5 years (z-scores)



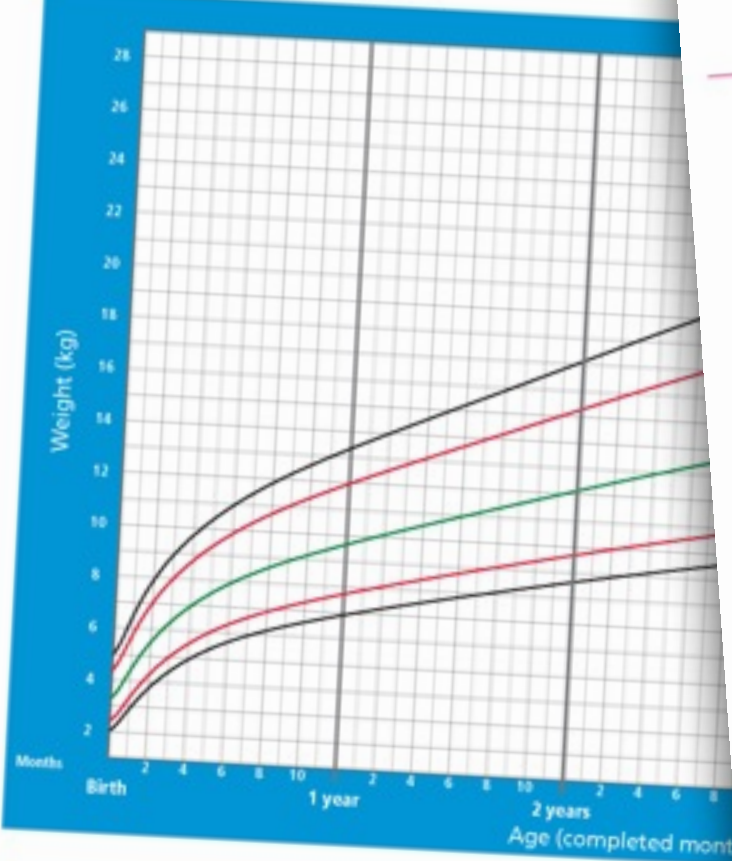
Weight-for-length BOYS
Birth to 2 years (z-scores)



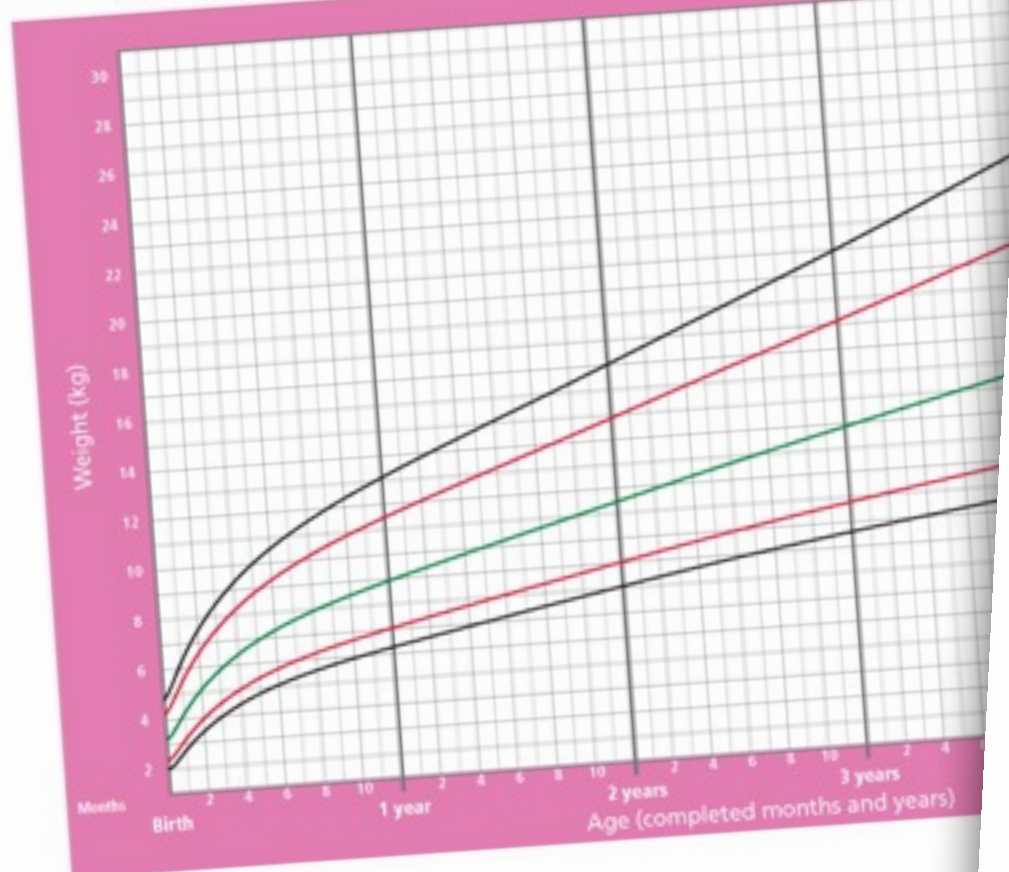
Weight-for-length GIRLS
Birth to 2 years (z-scores)



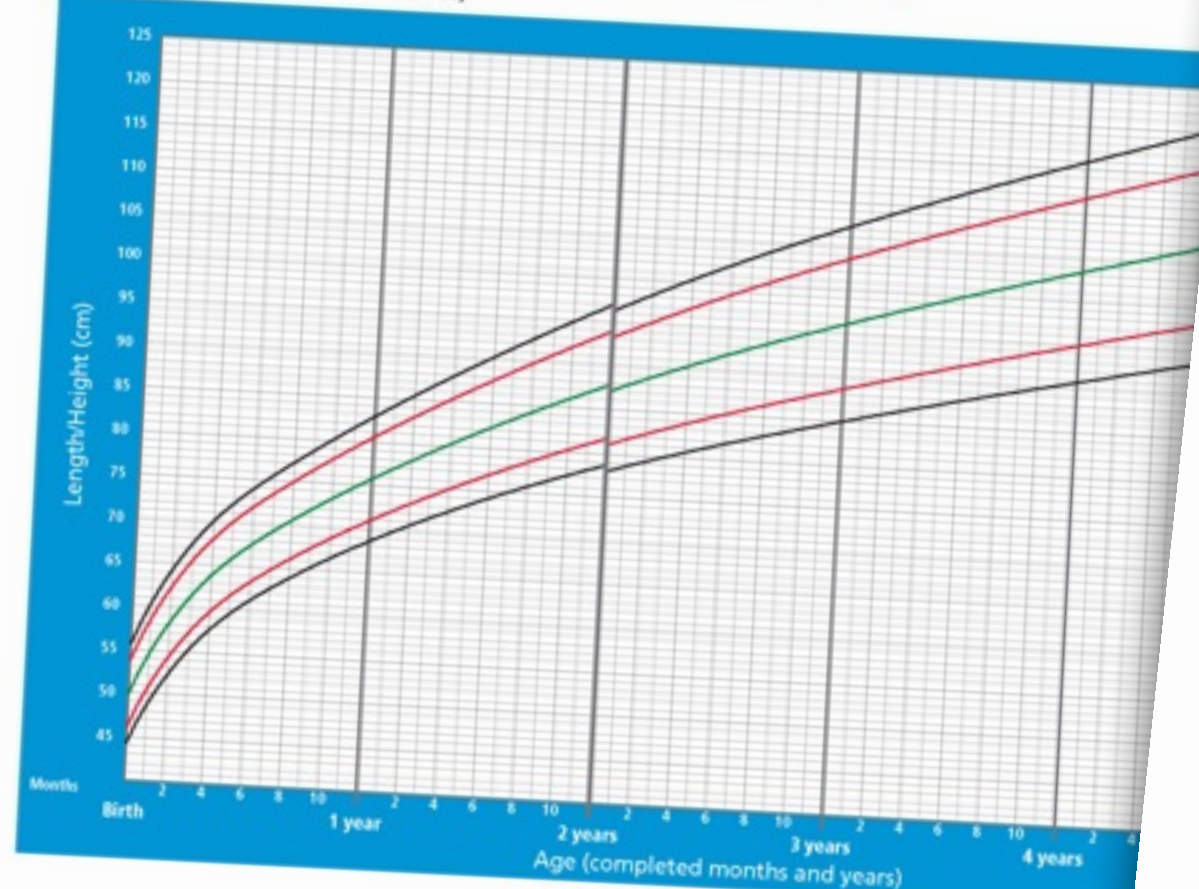
Weight-for-age BOYS
Birth to 5 years (z-scores)



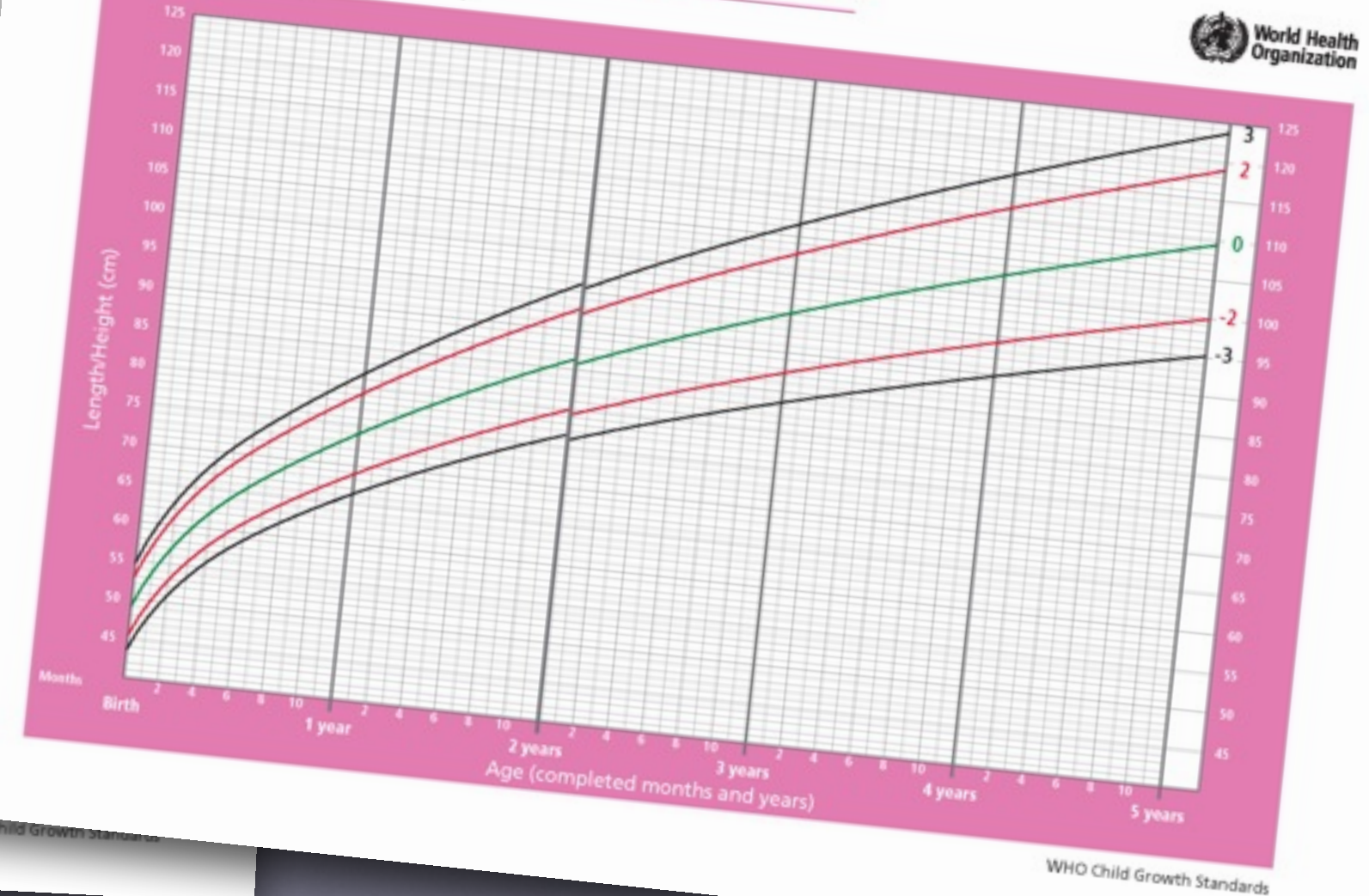
Weight-for-age GIRLS
Birth to 5 years (z-scores)

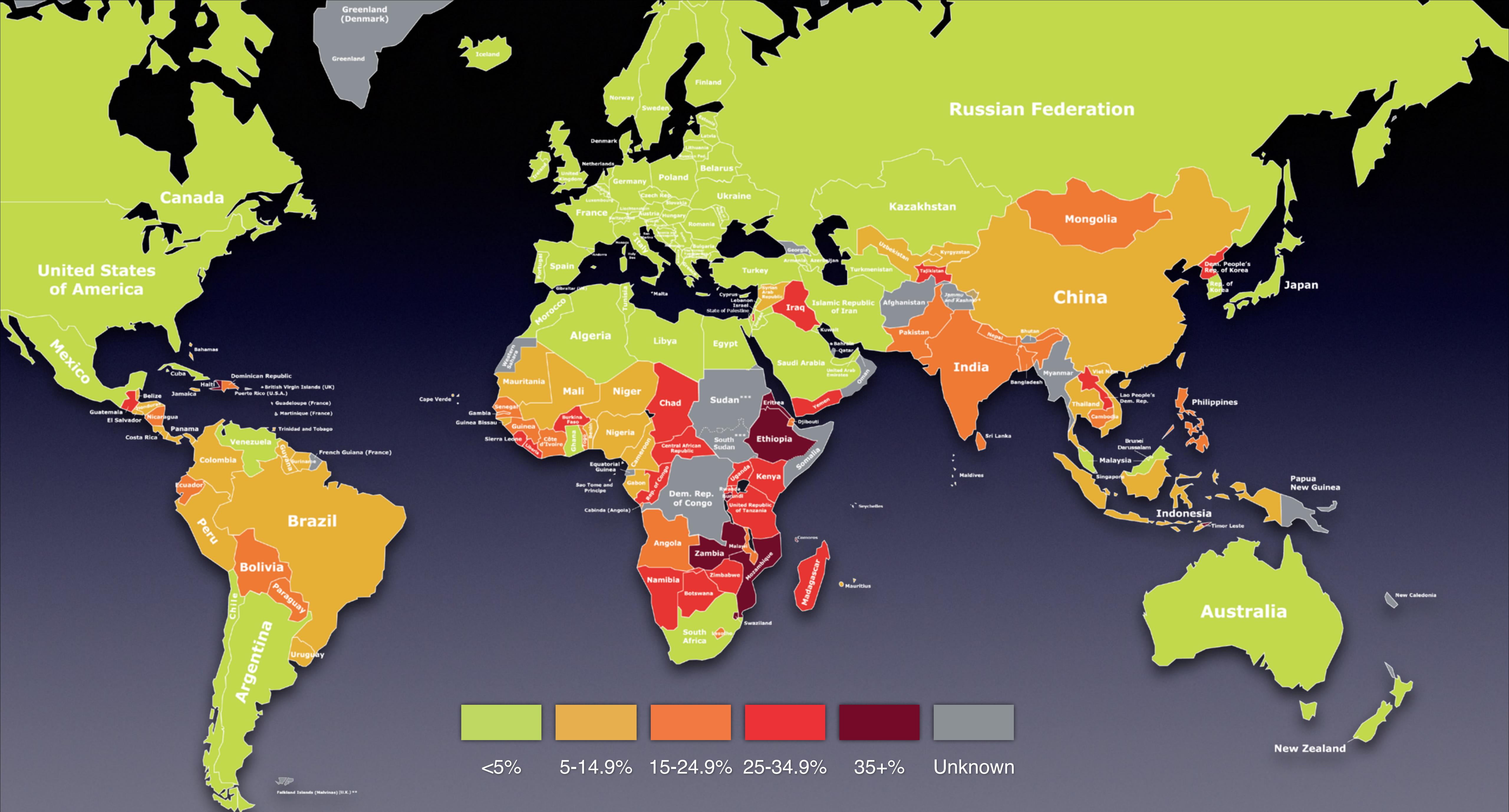


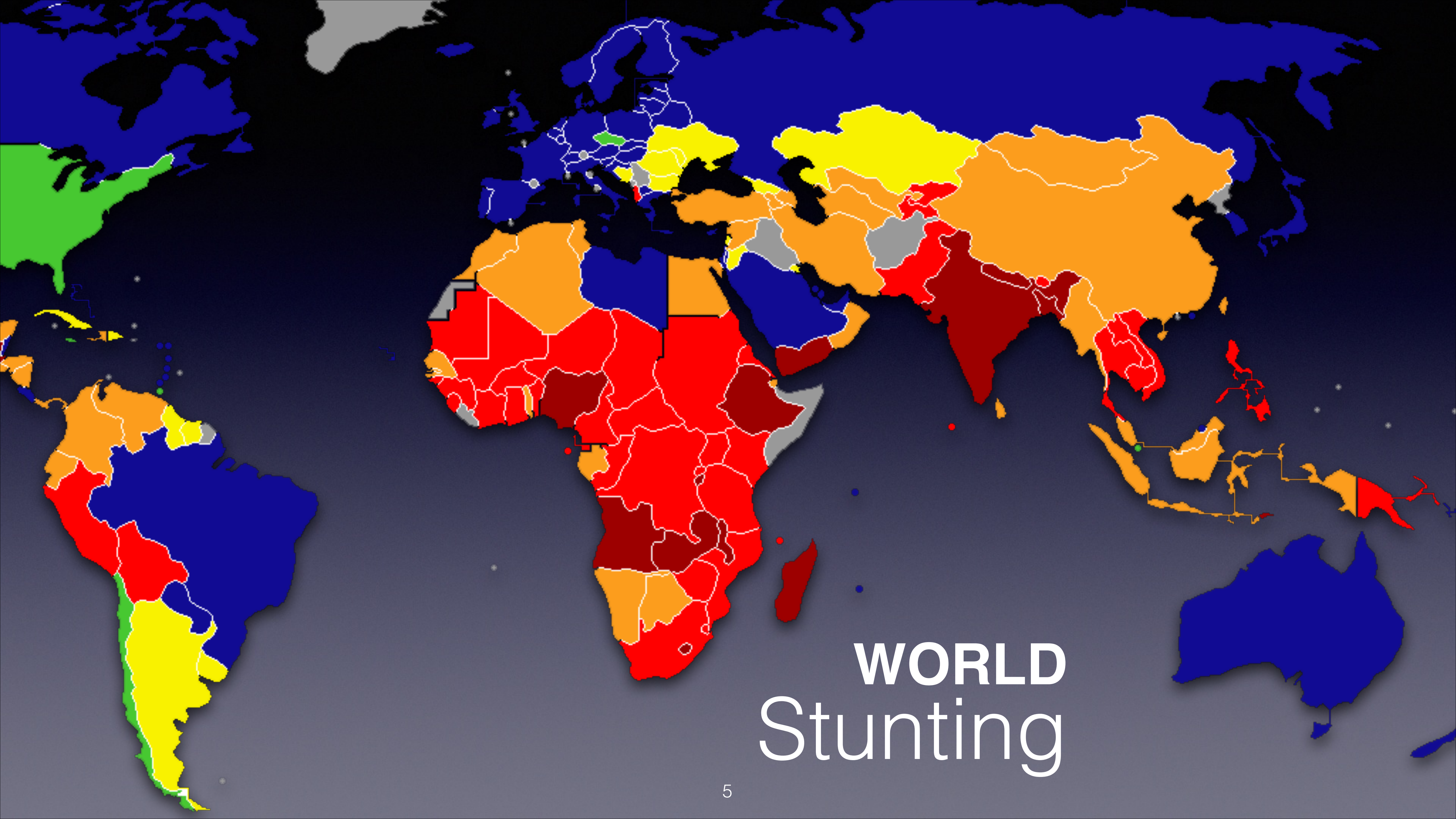
Length/height-for-age BOYS
Birth to 5 years (z-scores)



Length/height-for-age GIRLS
Birth to 5 years (z-scores)

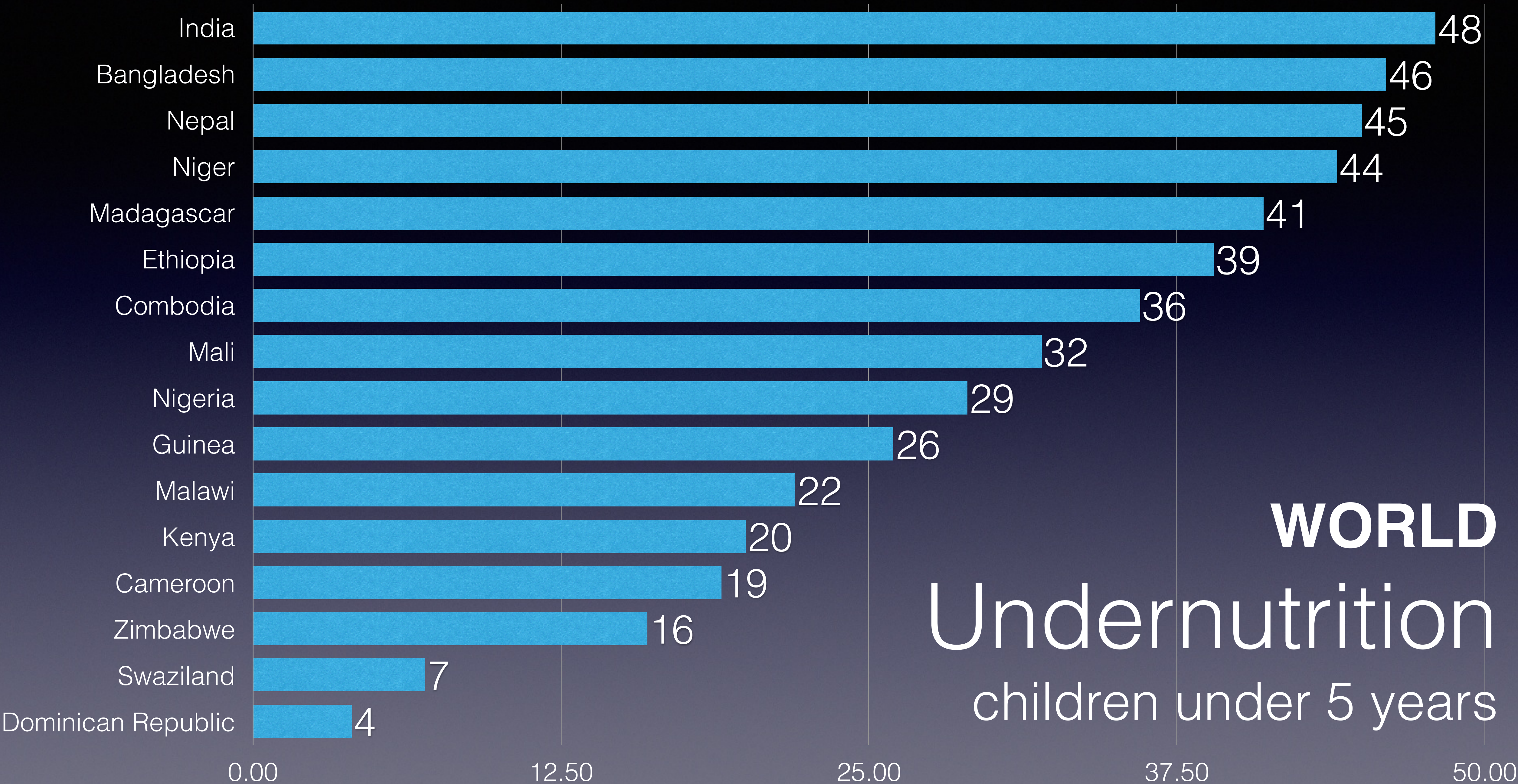






WORLD Stunting



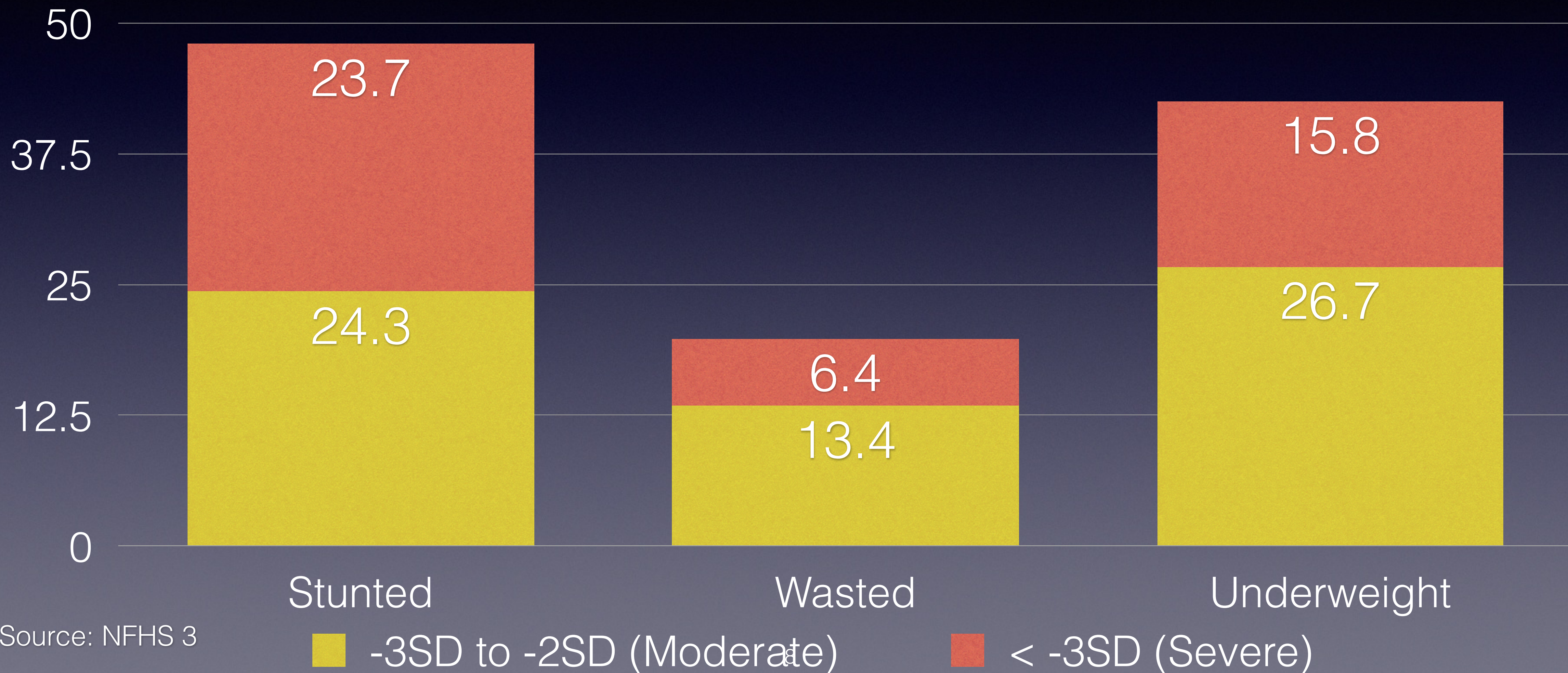


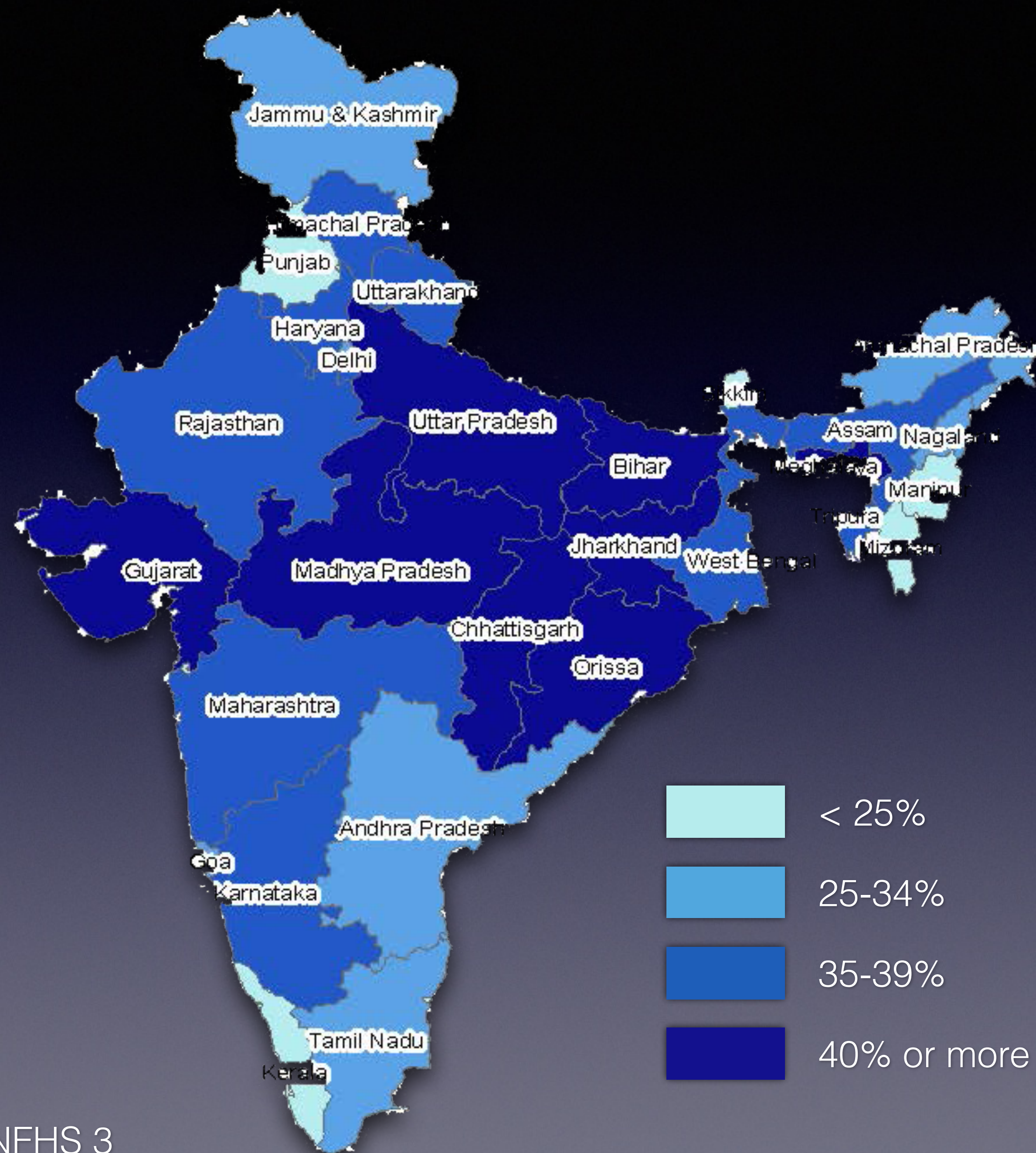
WORLD
Undernutrition
children under 5 years

Source: NFHS 3

Percent underweight, based on the NCHS/WHO Growth Reference

Malnutrition in India





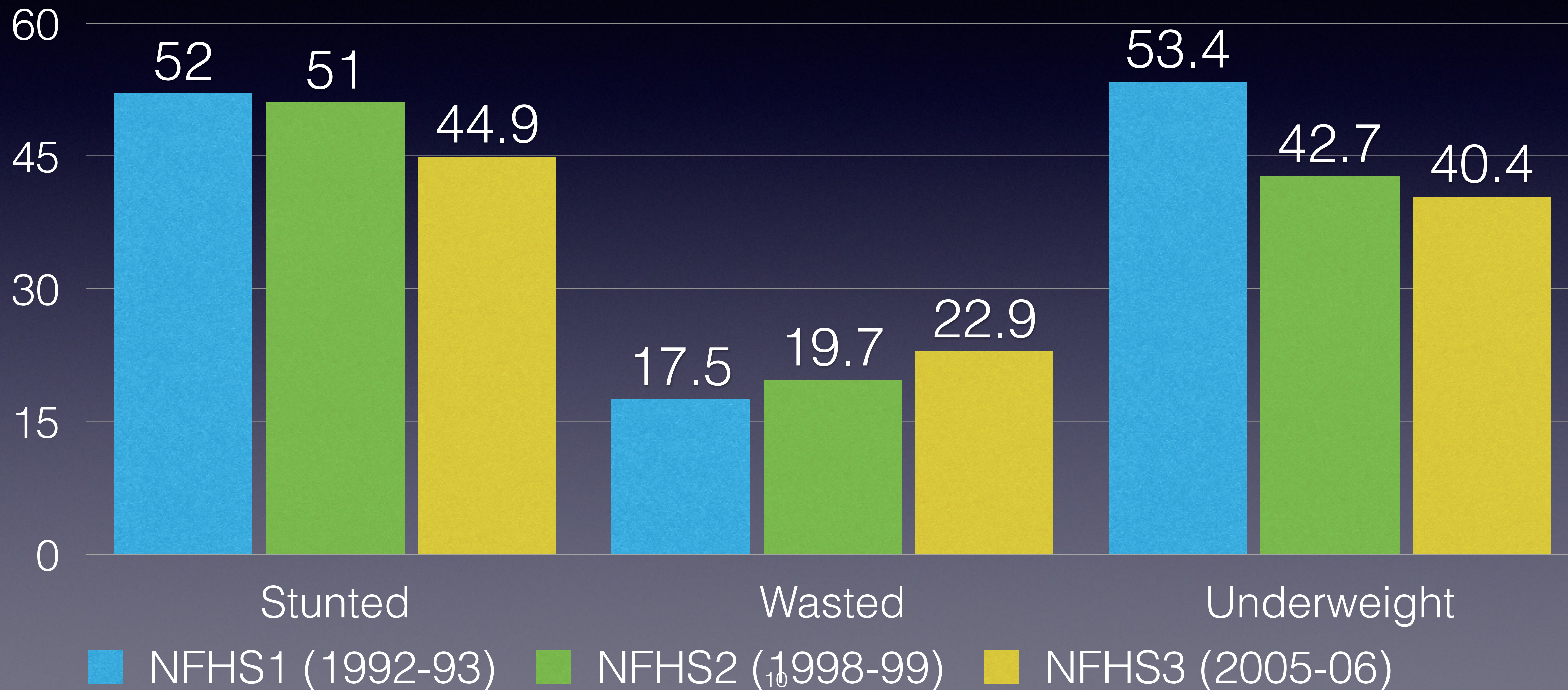
INDIA

Undernutrition

children under 5 years

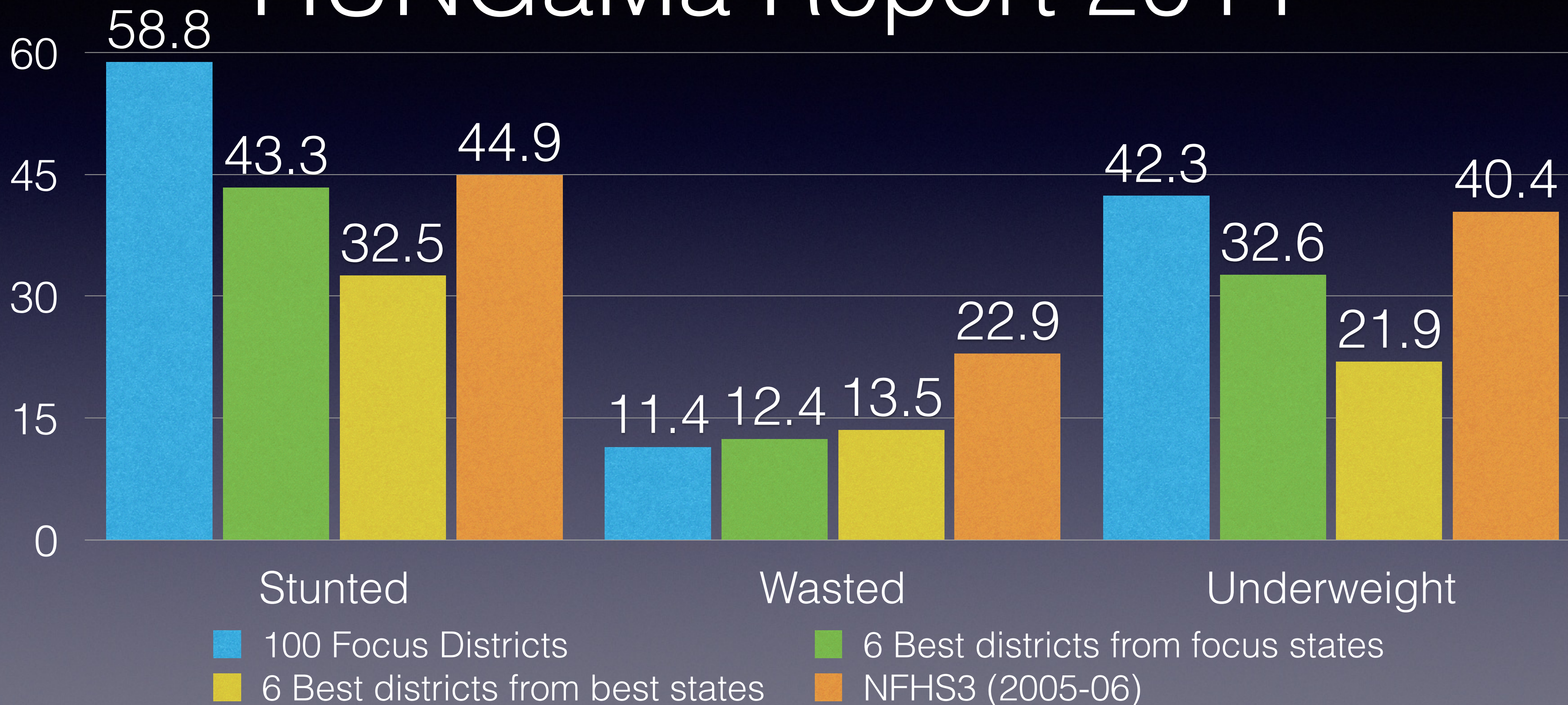
Source: NFHS 3

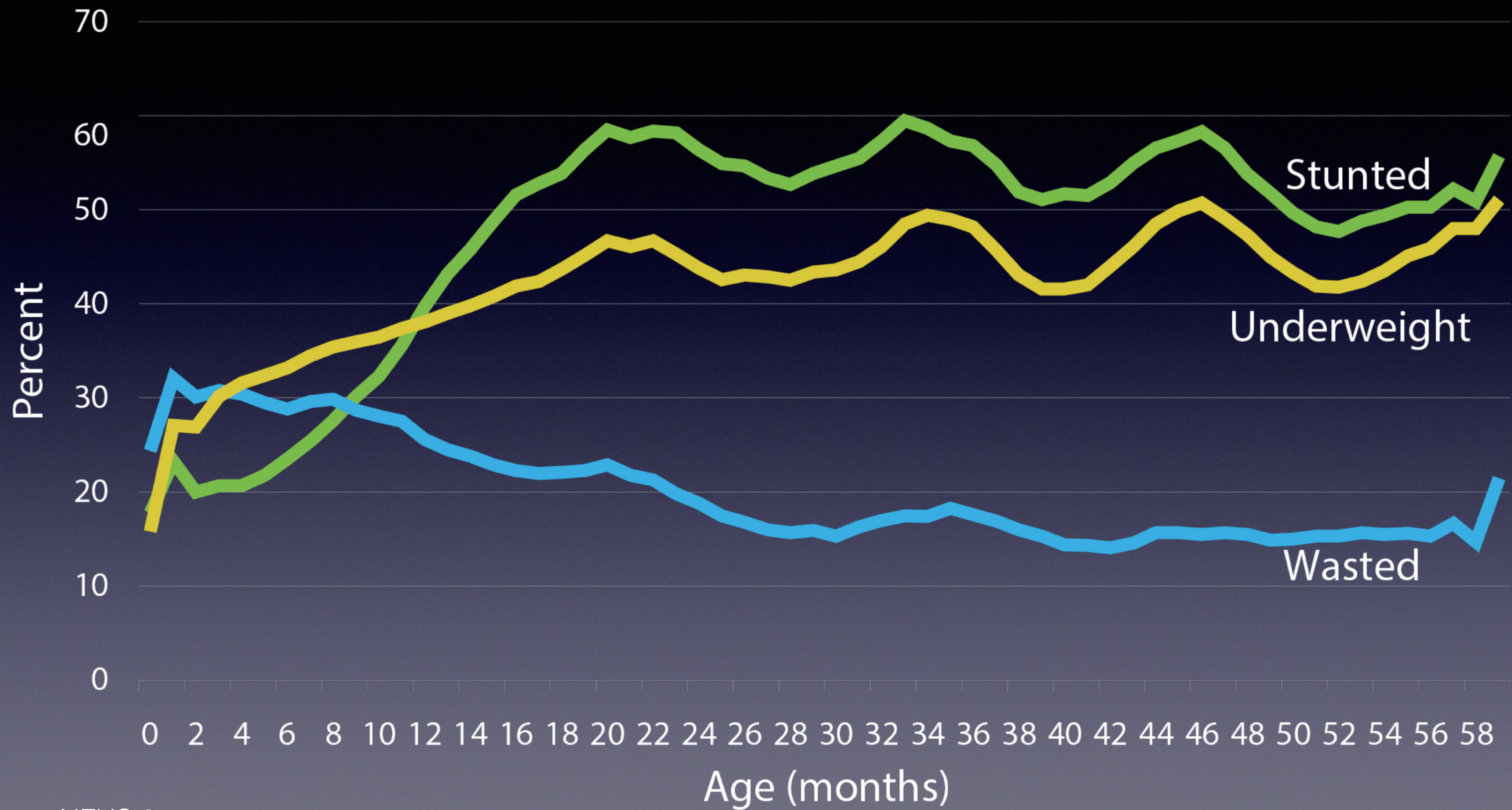
Malnutrition in India



Malnutrition in India

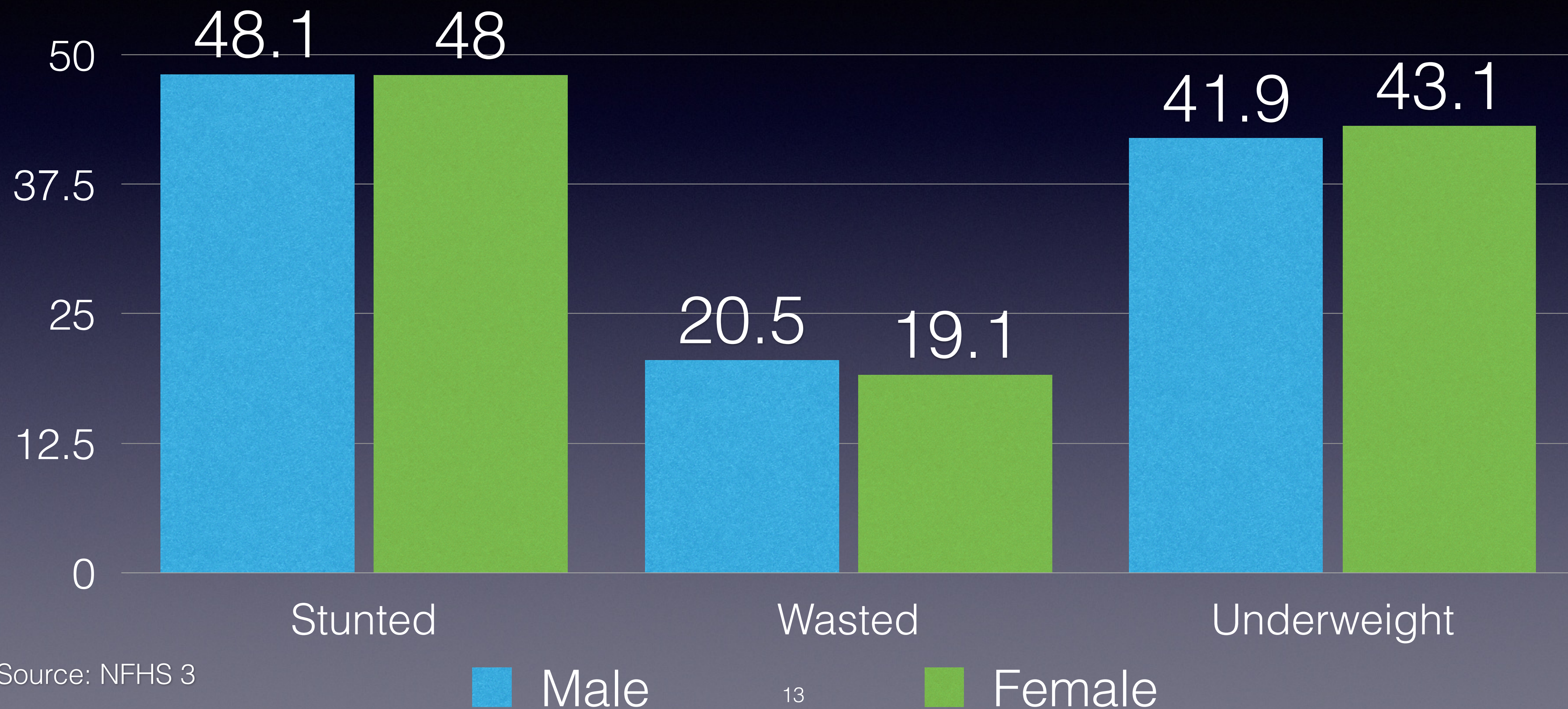
HUNGaMa Report 2011



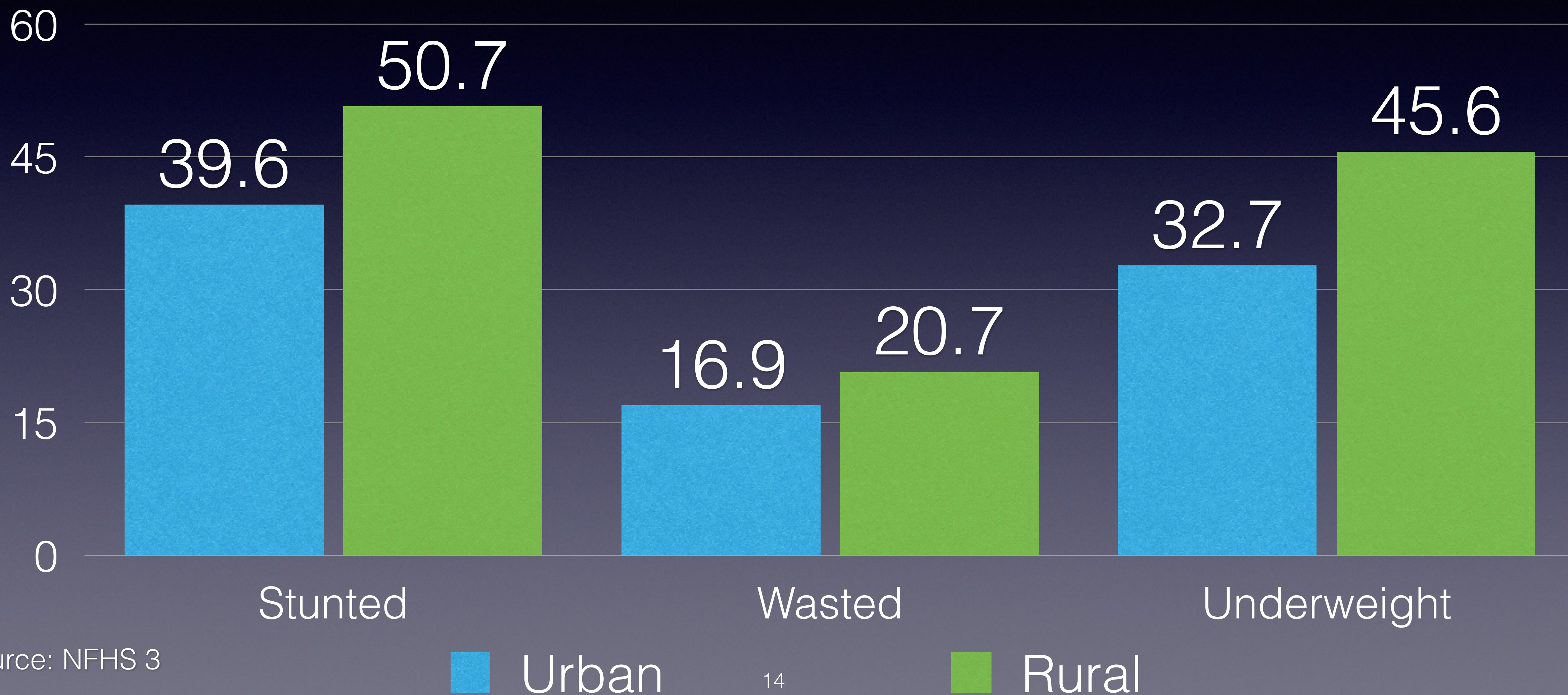


Source: NFHS 3

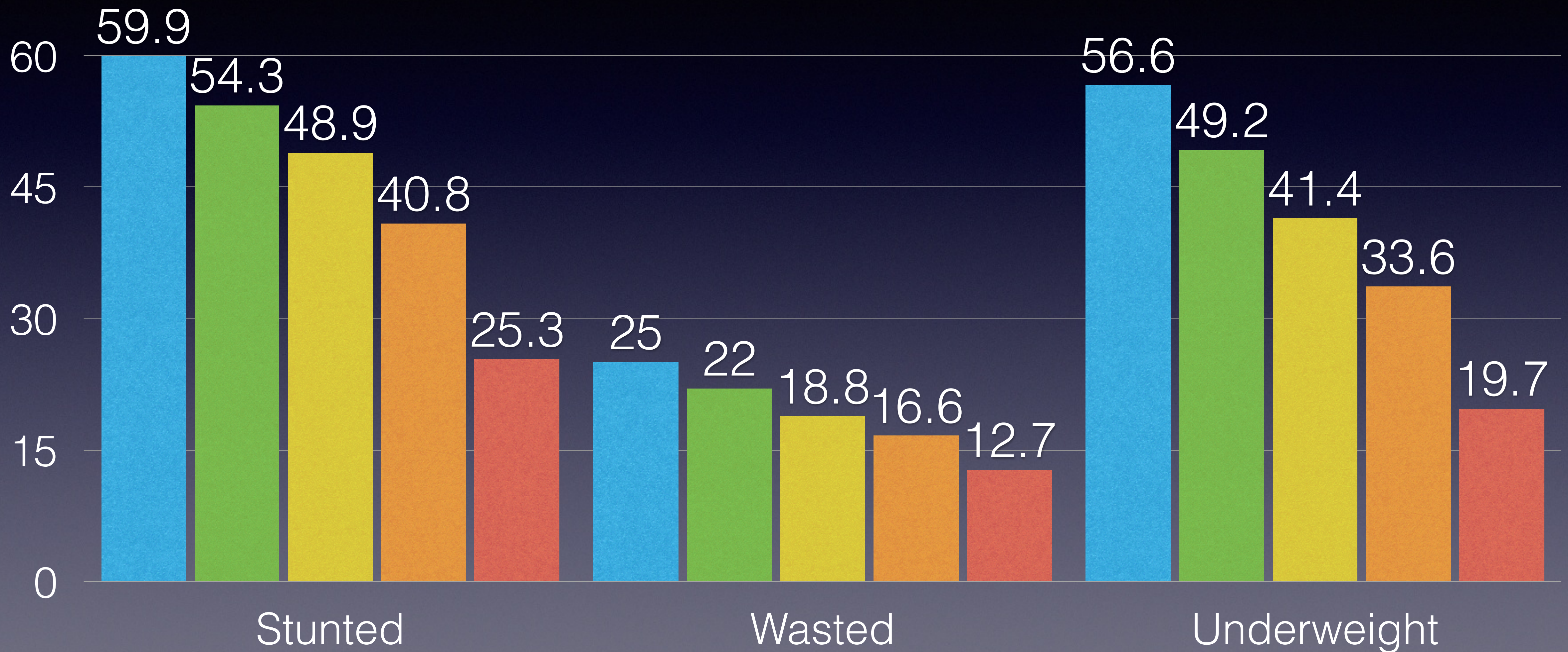
Malnutrition in India, by sex



Malnutrition in India, Urban and Rural



Malnutrition in India, Wealth Index



Source: NFHS 3

Lowest WI Second WI Middle WI Fourth WI Highest WI

Diagnostic criteria for Severe Acute Malnutrition (SAM), 6–60 months

Indicator	Measure	Cut-off
Severe wasting	Weight-for-height	< -3SD
Severe wasting	MUAC	< 115mm
Bilateral Odema	Clinical Sign	

Factors that lead to Malnutrition

Food Shortage

Food Poverty

Food Deprivation

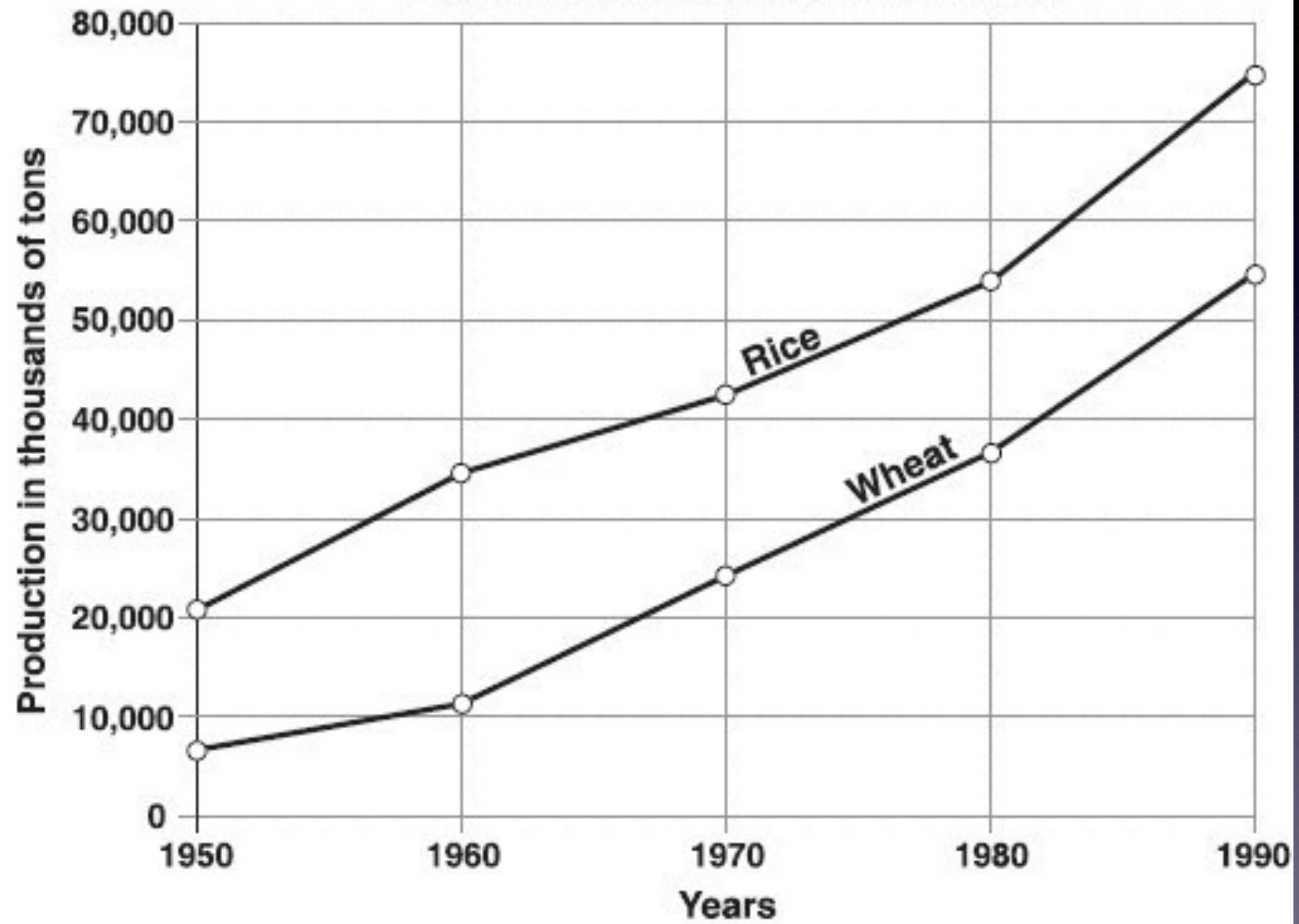
Food Shortage

- Green Revolution (1960s)
- Yellow Revolution (oilseed: 1986-1990)
- Operation Flood (dairy: 1970-1996)
- Blue Revolution (fishing: 1973-2002)
- Evergreen Revolution

Green Revolution

- Use of high yielding varieties (HYV) of seeds
- Irrigation
- Use of insecticides and pesticides
- Land reforms
- Improved rural infrastructure

The Green Revolution in India



Food Poverty

Public Distribution System

Food Security Bill

Public Distribution System

- **Central government:** procurement, storage, transportation, and bulk allocation of food grains
- **State governments:** distributing through Fair Price Shops (FPSs).
- **BPL: 35 kg** of rice or wheat every month; **APL: 15 kg** of food grain per monthly

Food Security Bill

- Subsidised food grains to approximately two thirds of India's population
- 75% rural and 50% of the urban population
- The states are responsible for determining eligibility
- **Pregnant women and lactating mothers:** "take home ration" of 600 Calories and a maternity benefit of at least Rs 6,000 for six months

Rice : Rs 3 / kg
Wheat : Rs 2 / kg
Coarse grains (millet) : Rs 1 / kg

Food Security Bill

- **Children 6 months to 14 years** of age are to receive free hot meals or "take home rations"
- The eldest woman in the household, 18 years or above, is the head of the household for the issuance of the ration card;
- The cost of the implementation is estimated to be \$22 billion (1.25 lac crore), approximately 1.5 % of GDP.
- The poorest who are covered under the Antodaya yojna will remain entitled to the 35 kg of grains allotted to them under the mentioned scheme.

Food Deprivation

Infant and Young Child Feeding

Integrated Childhood Development Services (ICDS) Scheme

Infant and Young Child Feeding

- Advocate the cause of **infant and young child nutrition** and its improvement through optimal feeding practices nationwide
- Disseminate widely the correct **norms of breastfeeding and complementary feeding** from policy making level to the public at large

Infant and Young Child Feeding

- Raising awareness and increasing commitment of the concerned sectors for achieving **optimal feeding practices for infants and young children**
- Achieve the national goals set by the Planning Commission to achieve **reduction in malnutrition levels in children**

Integrated Childhood Development Services

1. Improve the **nutritional and health status of children** (0-6 years)
2. Proper psychological, physical and social development of the child
3. Reduce the incidence of mortality, morbidity, **malnutrition** and school dropout
4. Achieve effective co-ordination of policy and implementation amongst the various departments to promote child development
5. Enhance the capability of the mother to look after the normal health and **nutritional needs of the child through proper nutrition** and health education

Beneficiaries

- **Children in age-group 0-6 years**
- Pregnant and lactating women
- Women in the reproductive age-group
- Adolescent girls

Services

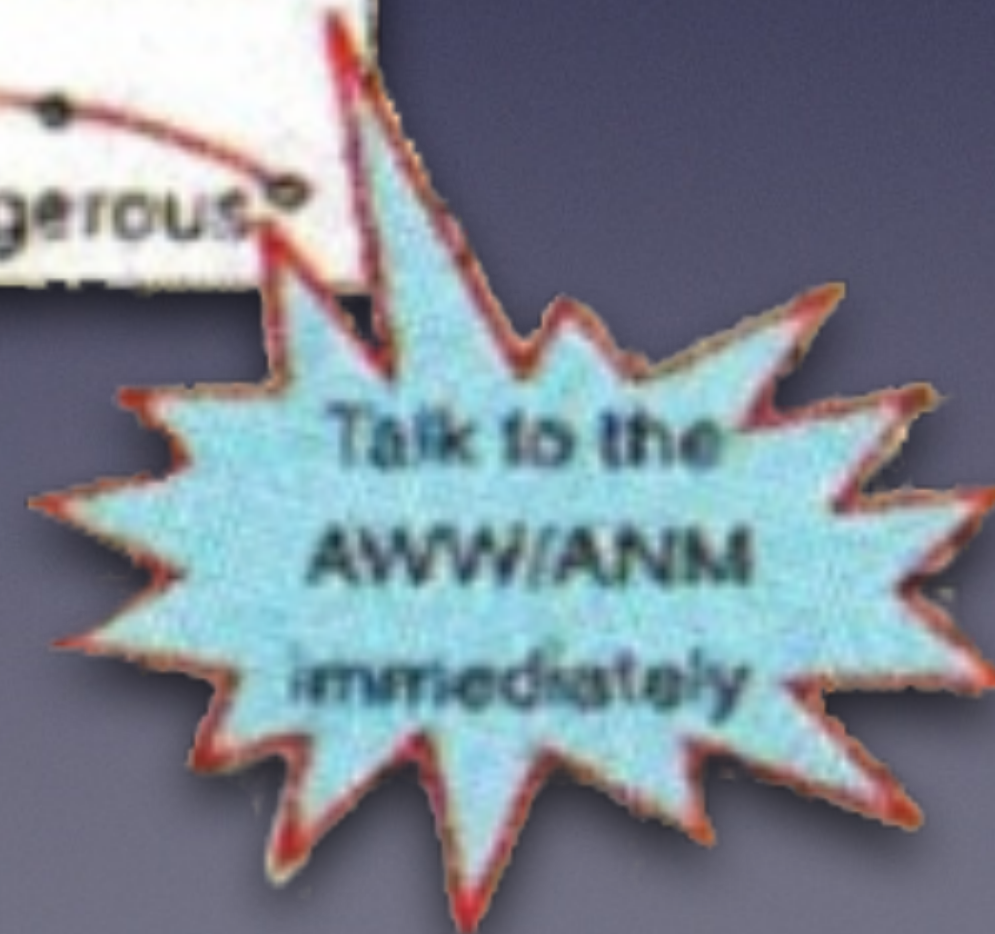
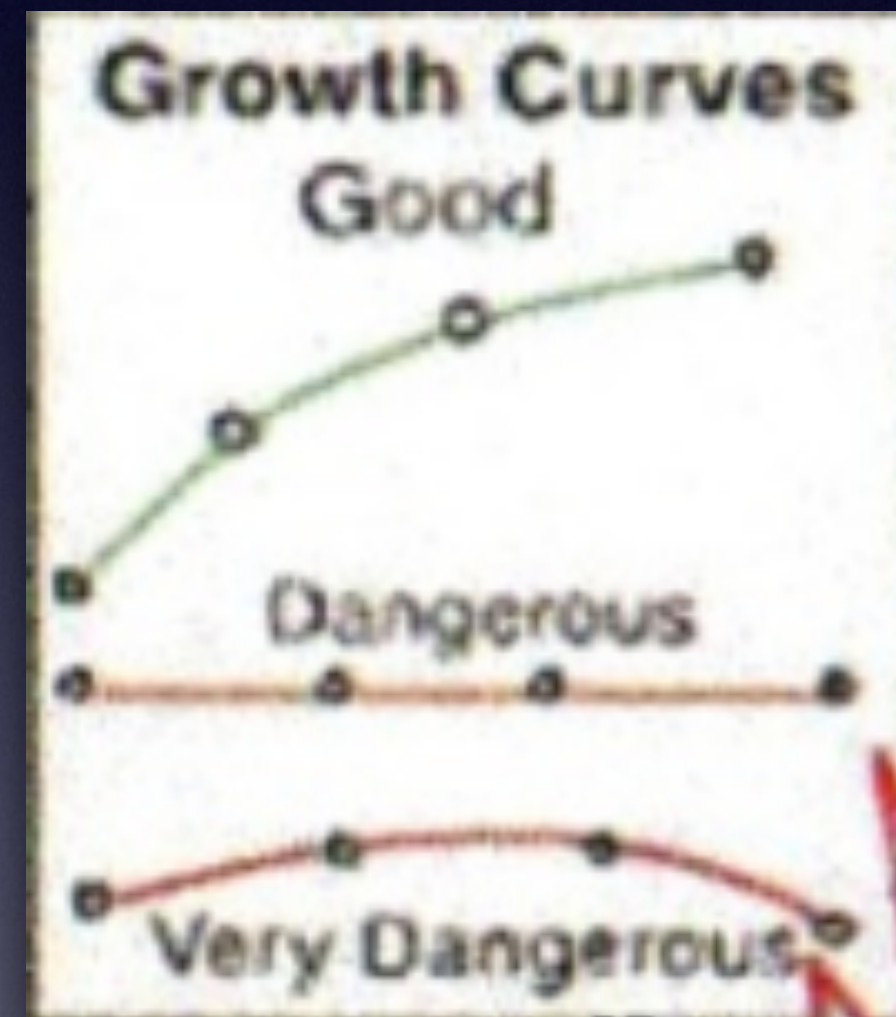
- **Supplementary nutrition**
- Immunisation
- Health check-up - **Growth Monitoring & Promotion**
- Referral services
- Pre-school non-formal education and
- **Nutrition** & health education

Growth Monitoring and Promotion

Feeding, Playing and communicating with children helps them grow and develop well

 <ul style="list-style-type: none"> Continue to offer a wide variety of foods including family foods, such as rice/ chappali, dark green leafy vegetables, orange & yellow fruits, pulses and milk products Feed the child about 5 times a day Feed from a separate bowl and monitor how much the child eats Sit with the child and help her finish the serving Continue breastfeeding upto 2 years or beyond 	<p>Stack up & to put the containers and take out.</p>  <p>Express wants</p>  <p>Put 3 pebbles in a cup</p>  <p>Walk well</p>  <p>Ask your child simple questions. Respond to your child's attempts to talk.</p> 	<p>Stand on one foot with help</p>  <p>Say one other word</p>  <p>Imitate household work</p> 	
<p>Continue breastfeeding during illness Always use adequately iodized salt for the family Child needs extra food after illness</p>			
<p>2 to 3 years</p> <p>Feeding</p>  <ul style="list-style-type: none"> Continue to feed family foods 5 times a day Help the child feed herself / himself Supervise feeding Ensure hand washing with soap before feeding 	<p>What you can do</p> <p>Help your child count and compare things; make simple toys for your child.</p>  <p>Encourage your child to talk & respond to your child's questions. Teach your child stories, songs, and games.</p> 	<p>What children can do</p> <p>Around 2½ years most children can</p> <p>Point to 4 body parts</p>  <p>Feed self spilling little</p>  <p>Name one colour correctly</p> 	<p>Around 3 years most children can</p> <p>Copy & draw straight line</p>  <p>Wash hands by herself</p>  <p>Name 3 out of 4 objects</p> 
<p>If the child seems slow, increase feeding, talking and playing. If the child is still slow, take the child to a doctor</p>			

Growth Monitoring and Promotion



Steps of Malnutrition Management

1. Treat/prevent hypoglycaemia
2. Treat/prevent hypothermia
3. Treat/prevent dehydration
4. Correct electrolyte imbalance
5. Treat/prevent infection
6. Correct micronutrient deficiencies
7. Start cautious feeding
8. Achieve catch-up growth
9. Provide sensory stimulation and emotional support
10. Prepare for follow-up after recovery

Stabilisation Phase

Rehabilitation Phase

Days 1-2

Days 3-7

Weeks 2-6

1. Hypoglycaemia

2. Hypothermia

3. Dehydration

4. Electrolytes

5. Infection

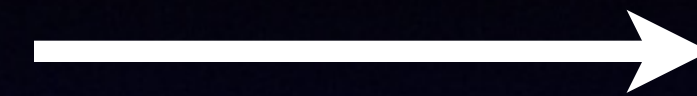
6. Micronutrients

7. Cautious feeding

8. Catch-up growth

9. Sensory stimulation

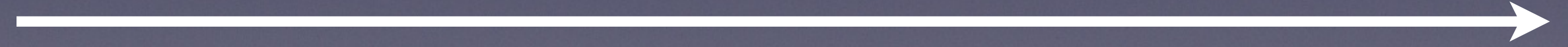
10. Prepare for follow-up



no iron



with iron



Managing Malnutrition

- **Village Child Development Centre (VCDC)** at the village level
- **Child Treatment Centre (CTC)** at PHC level
- **Nutrition Rehabilitation Centre (NRC)** at the level of Rural/District Hospital

In VCDCs

- SAM/MAM with no illness

In CTCs

- SAM/MAM with illness
- SAM/MAM not Improved in VCDC

In NRCs

- SAM/MAM not improved in CTCs
- SAM/MAM with critical illness requiring pediatric services

Village Child Development Center

- Screening by the Anganwadi workers
- Children identified as SAM or MAM with no medical complications
- Run for 30 days in Anganwadis
- 70% Improve
- Rest are referred to the Child Treatment Centers at the PHC

Name of Drug	Dose	Time
Albendazole drug	1-2 Yrs 200mg (5ml) 2-3 Yrs 400mg (10ml) 3-6 Yrs 400mg (1Tab)	Once time before VCDC
Vitamin A	1 ml below 1yr child 2 ml above 1 yr child	Once time before VCDC
Folic acid	1mg, 1 Tab every day	Morning 1st 7 days
Amoxicillin	25mg/ kg / day	TDS for 7 days SAM & infected children
Multi Vitamin	1 to 2 yr - 2 ml 2 to 6 yr - 4 ml	Afternoon
Calcium + Vit D3	1ml/ kg/ day	Morning
Iron Folic Acid	3mg Iron / kg / day	After 7 days, if gaining weight and free from infection

1 to 30 Days		Nutrition		Ideally Nutritive Requirement
Time	Calories	Protein	Nutrition for each child	
8:00 AM	420	8	Amylase rich flour Shira / Upma / Lapshi	100gm
10:00 AM	Anganwadi food + 5ml oil			
12:00 noon	Anganwadi food + 5ml oil			
2:00 PM	Home Diet			
4:00 PM	100	4	1 Boil Potato, 1 Banana / 1 Egg, 1 Banana	100gm
6:00 PM	420	8	Amylase rich flour Shira / Upma / Lapshi	100gm
8:00 PM	Home Diet			

Child Treatment Centers

- Started in Nov 2007 for 21 days in Health facilities like PHCs/RH.
 - SAM/MAM with illness
 - SAM/MAM Not Improved in VCDC
- Over 5038 CTC camps held since 2008 up to Dec 2012 with around 37,565 malnourished children admitted for treatment
- Improvement in 70% children

Nutritional Rehabilitation Centers

1. Provide **clinical management** and reduce mortality among children with SAM
2. Promote **physical and psychosocial growth** of children with SAM
3. **Build the capacity of mothers and other care givers** in appropriate feeding and caring practices for infants and young children
4. **Identify the social factors** that contributed to the child slipping into SAM

Services

- 24 hour care and monitoring of the child.
- Treatment of medical complications
- Therapeutic feeding
- Providing sensory stimulation and emotional care
- Social assessment of the family to identify and address contributing factors
- Counseling on appropriate feeding, care and hygiene
- Demonstration and practice-by-doing on the preparation of energy dense child foods using locally available, culturally acceptable and affordable food items
- Follow up of children discharged from the facility

Planning for NRCs in a district

Total population of the district	2 million
Total under 5 population (14%)	2,80,000
Total under 5 children with SAM (8%)	22,400
Total SAM with Medical Complications (10%)	2,240
Average Hospital stay	10 days
Total bed days 2240×10	22400
Total beds required = Total bed days/365 days	60

- 1 NRC of about 20 beds at the district hospital
- 4 NRCs of 10 beds each at FRUs/CHCs/sub-divisional hospitals

NRC should have

- **Patient area** to house the beds; in NRC adult beds are kept so that the mother can be with the child.
- **Play and counseling area** with toys; audiovisual equipment like TV, DVD player and IEC material.
- **Nursing station**
- **Kitchen and food storage area** attached to ward, or partitioned in the ward, with enough space for cooking, feeding and demonstration.
- **Attached toilet and bathroom facility** for mothers and children along with two separate hand washing areas.

Acceptable levels of care

Indicators	Acceptable	Not acceptable
Recovery rate	>75%	<50%
Death rate	<5%	>15%
Defaulter rate	<15%	>25%
Weight gain (g/kg/d)	≥8g	<8g
Length of stay (weeks)	1-4	<1 and >6

Thank You